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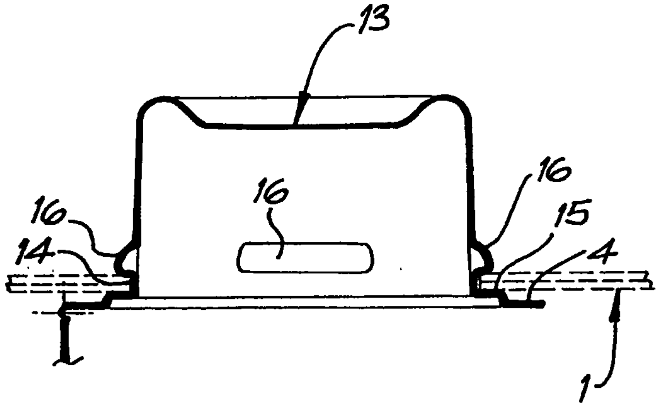
(54) Title: IMPROVEMENTS IN OR RELATING TO BLISTER PACKAGING



(57) **Abstract:** A blister holder has a flexible base (13) and a plinth (15) surrounding its open-side. Integrally moulded with the blister are four ribs (16) which are spaced from the plinth (15) to provide means for locating a double-thickness carrier sheet (1) between them. The carrier sheet is made from cardboard sufficiently flexible to be easily printed and which is provided with a fold-line and registering apertures on opposite sides of the fold-line. The blister holder can be pushed through registering aperture of the sheets and the material forming the wall of the blister yields sufficiently for the ribs (16) to pass through the registering apertures so that the double thickness of the carrier (1) is trapped between the rib (16) and the plinth (15). The double thickness of the carrier resists :subsequent withdrawal movement of the holder in the reverse direction.

WO 2004/083069 A1

IMPROVEMENTS IN OR RELATING TO BLISTER PACKAGING

FIELD OF THE INVENTION

THIS INVENTION relates to blister packaging and is more specifically concerned with an improvement in, or modification of the invention disclosed in the specification of Standard Patent Application No. 14742/02 (hereinafter referred to as "the Parent Application") to which the present application is for a patent of addition.

STATE OF THE ART

Items such as pharmaceutical medication in the form of tablets and capsules prescribed by a doctor, are commonly dispensed by pharmacists to patients in the form of blisters pre-loaded with medication the patient is required to take at a particular time on a particular day. These blisters are commonly mounted on a carrier sheet marked with the times of day and the days of the week when the medication is to be taken.

Blister packaging mounted on a carrier sheet as described above is easy and convenient to use when the patient is educated and understands the need to comply with a doctor's advice. However there are sections of the community which, because of their remoteness, may be poorly educated or live a nomadic life style. This results in conventionally designed blister packaging being easily damaged or mislaid, and often the compliance markings on them cannot be understood. The cost of replacing such packaging can be considerable – quite apart form the cost of replacing the medication – and this increases the difficulties associated with servicing the health needs of isolated outback communities.

The Parent Application provides blister packaging which reduces these problems. It describes a blister package for mounting in an aperture of a printed carrier sheet and which comprises a holder made from plastics material and having a loading opening surrounded by a resiliently flexible wall portion providing a socket, a lid for closing the opening and formed with a resiliently flexible spigot which fits snugly into the socket to close it securely; co-operating fixtures on the spigot and socket which retain the lid closed until the packaging is to be opened; means for facilitating the removal of the lid from the holder when its contents are to be accessed; and, spaced elements projecting outwardly from the blister package in the vicinity of the spigot and socket, at least one of the elements being spaced from the holder opening by a distance not less than the thickness of the carrier sheet. Such a blister package will hereinafter be described as "a blister package of the type defined".

A problem which can be encountered with a blister package of the type defined, as that the force required to open the lid, which is a snug fit in the socket of the holder may pull said one element of the holder past the marginal edge of the aperture in the carrier sheet with the result that the holder is no longer firmly attached to the carrier sheet. One could, for example, overcome this problem by using a stiffer carrier sheet. However the carrier sheet carries printing, and problems are encountered when printing stiff sheets of material which are not present when printing flexible sheets of material. This problem increases the cost of production of the blister packaging.

OBJECT OF THE INVENTION

An object of this invention is to provide an improved blister package.

THE INVENTION

In accordance with the present invention blister packaging comprises in combination, a blister package for mounting in an aperture of a printed carrier sheet and which comprises a holder made from plastics material and having a loading opening surrounded by a resiliently flexible wall portion providing a socket; a lid for closing the opening and formed with a resiliently flexible spigot which fits snugly into the socket to close it securely; co-operating fixtures on the spigot and socket which retain the lid closed until the packaging is to be opened; means for facilitating the removal of the lid from the holder when its contents are to be accessed; and, spaced elements projecting outwardly from the blister package in the vicinity of the spigot and socket, at least one of the elements being spaced from the holder opening by a distance not less than twice the thickness of the carrier sheet which is formed from at least two superimposed sheet thicknesses, each thickness having a line of apertures containing the holders and which register with corresponding apertures in the second thickness of the sheet .

PREFERRED FEATURES OF THE INVENTION

Preferably the superimposed thicknesses of flexible sheeting are formed from a single flexible sheet which is first printed and apertured to provide two parallel lines of apertures, and is provided with a weakened fold line suitably positioned midway between the two aperture lines and which allows the sheet to be folded easily along the line, after printing, to bring the lines of apertures into registration so that each holder is snugly held in position by at least a double thickness of the carrier sheet. The fold line conveniently comprises a crease line in the sheet.

INTRODUCTION TO THE DRAWINGS

The invention will now be described in more detail, by way of example, with reference to the accompanying largely diagrammatic drawings, in which:-

IN THE DRAWINGS

FIGURE 1 is a plan view of an unfolded flexible cardboard carrier sheet bearing printing and formed with two lines of aperturing and a crease line extending midway between the two lines of apertures;

FIGURE 2 is a side view of a blister packaging combination comprising a line of blister packages held in place by a double thickness of the carrier sheet;

FIGURE 3 is a side view of two blister packages in their open condition and mounted on a folded carrier sheet, the positions of lids of the package when in their closed positions being shown in phantom outline;

FIGURES 4, 5, 6 and 7 are sections through figure 3 taken on the lines and in the directions of the arrows IV-IV, V-V, VI-VI and VII-VII respectively; and,

FIGURE 8 is a plan view of the assembled blister packaging.

DESCRIPTION OF PREFERRED EMBODIMENT

Figures 1 and 2 show a flexible carrier sheet of printed cardboard 1 about 1mm. thick and providing a carrier having two parallel lines of seven apertures 3. A crease line 9 is formed midway between the two lines of apertures 3 and provides a line of weakness along which the sheet may be easily folded.

Figure 2 shows a line of seven blister packages 2 which are vacuum-formed from a transparent strip 4 of thermo-plastics material. As shown in figure 3 each package comprises a holder 5 connected by a hinge line 6 to a lid 7. The material of the strip 4 is such that it is stiffly resiliently flexible but when its thickness is reduced in the region of the central portion 13 of the holder 5 by the vacuum-forming process, the material of the strip 4 loses its resilience and acquires great flexibility. Typically the strip is made from polyvinylchloride (PVC) and is 0.3 mm thick before it is vacuum-formed.

As shown in figures 3, 4 and 7, the holder 5 is rectangular in plan with rounded corners when viewed in cross-section, and is sufficiently deep to hold a number of medications or tablets which are to be taken by a patient at a particular time on a particular day. These times and days are signified by printing on the carrier sheet 1 alongside the blister packages as shown in figure 8. The holder provides a generally rectangular medication loading opening 12 which may be closed by the insertion into it of a spigot 10 provided on the lid 7. The lid is also provided with an upwardly-angled tab portion 20 which can be gripped between the fingers to pull the spigot 4 from the socket of the holder 5 when the package is to be opened.

As may be seen from figures 3, 4 and 6, the portion of the holder 5 surrounding the opening 12 provides a wall 14 which is still resiliently flexible, as its thickness has not been reduced to the same extent as the central portion 13. An element in the form of a plinth-like flange 15 surrounds the wall 14 around the opening 12 and is formed during the blow-moulding process. The flange limits movement of the holder 5 in one direction through the aperture 3 of the carrier sheet 1.

To assemble the blister packaging the sheet 1 is first folded along the crease line 9 to provide a carrier of double thickness of the sheet and with the two lines of apertures 3 registering with one another.

The wall 14 of the opening 12 is provided with four outwardly projecting elements formed as ribs 16 extending parallel to, but spaced from the flange 15. One rib 16 is formed on each of the four sides of the holder, respectively, and the ribs provide elements for limiting movement of the holder 5 in the reverse direction through the aperture 3. One side of each rib is less sloping than the other to assist insertion of the holder into its aperture in the carrier while the more steeply sloping side of the rib resists movement of the holder in the reverse direction. The spacing between the steeply-sloping sides of the ribs 16 and the flange 15 is slightly larger than twice the thickness of the carrier sheet 1 so that the holder 5 can be inserted into any one of the registering sets of apertures in the folded sheet 1 until the less sloping sides of the ribs 16 encounter the marginal edge of the two thicknesses of sheet 1 surrounding the registering apertures. By exerting a little more pressure on the holder, the wall 14 of the holder yields resiliently to allow the ribs 16 to pass through the registering apertures 3. The holder 5 is now trapped in the opening 3 by contact of the more steeply sloping sides of its ribs 16 with one face of the double thicknesses of the sheet 1 and the contact of its flange 15 with the opposite face of the double thickness sheet 1.

The central spigot 10 provided on the lid 7 is shaped to fit snugly into the socket provided by the interior surface of the wall 14 of the holder 5. The spigot 10 is provided externally at its leading end with four elongated detents 17 shaped to fit in respective troughs provided by the interiors of the ribs 16 of the holder 5. This is shown in phantom outline in figure 3. Each lid 7 is separated from its neighbour by a cut in the strip 4, as shown at 18, so that the packages can be opened and closed independently. The hinge 6, provided by a reduced thickness line in the plastics material of the strip 4, ensures that the lid 7 and holder 5 of each package remain together when the package is opened.

The tab 20 formed along the edge-portion of the lid 7 remote from the hinge 6, is angled upwardly so that it can be easily gripped between the fingers to facilitate the progressive release of the lid from the holder 5 when it contents are to be accessed, without risk of the holder being dislodged from the registering apertures 3 of the carrier 1.

OPERATION OF PREFERRED EMBODIMENT

It will be noted from the phantom outline in figure 3 that when the package is closed, the spigot 10 fits snugly against the inside wall 14 and its detents 17 fit into the interiors of the ribs 16. As apparent from figures 5 and 6, the shape of the spigot 10 is such that it is fairly resistant to inward flexing. However this resistance is not sufficient to prevent the entry of the spigot 10 of the lid 7 into the socket provided by the wall 14 of the holder. The resistance to inward flexing of the spigot 10 acts to reinforce the natural resistance to inward flexing of the wall 14 of the holder 5 so that the sum of the two resistances is sufficient to prevent inadvertent withdrawal of the closed package from its opening 3 in the carrier sheet 1, as a result of inward yielding of the wall of the holder 5. The double thickness of the carrier sheet reduces the risk of its marginal edge surrounding the holder tearing from the force used to withdraw the lid 7 from the holder 5.

The above described arrangement of package is relatively cheap and easy to manufacture, assemble and use, and the spigot and socket arrangement of the lid and holder coupled with the avoidance of holes in the holder, greatly reduces risk of the contents of the closed holder being contaminated by dust and other pollutants. The package can be used many times without adverse effects, and can be made compactly by arranging the lines of openings 3 in staggered formation and by providing further fold lines on the carrier sheet. These enable the packages to interfit with one another when the sheet is folded to bring the assembly into its transport condition. The packages then protect one another from damage and the folded sheet can be transported inside a matchbox-like surrounding sleeve.

MODIFICATIONS OF PREFERRED EMBODIMENT

If desired, more than two superimposed thicknesses of the sheet of the carrier can be used should a thinner and more flexible card is required for the carrier sheet. Also, the printing may be provided on a separate paper sheet which can then be glued or otherwise attached to the sheet of the carrier.

CLAIMS:

1. Blister packaging comprising, in combination a blister package for mounting in an aperture of a printed carrier sheet and which comprises a holder made from plastics material and having a loading opening surrounded by a resiliently flexible wall portion providing a socket; a lid for closing the opening and formed with a resiliently flexible spigot which fits snugly into the socket to close it securely; co-operating fixtures on the spigot and socket which retain the lid closed until the packaging is to be opened; means for facilitating the removal of the lid from the holder when its contents are to be accessed; and, spaced elements projecting outwardly from the blister package in the vicinity of the spigot and socket, at least one of the elements being spaced from the holder opening by a distance not less than twice the thickness of the carrier sheet which is formed from at least two superimposed sheet thicknesses, each thickness having a line of apertures containing the holders and which register with corresponding apertures in the second thickness of the sheet.

2. Blister packaging as claimed in claim 1, in which the carrier sheet is formed from flexible sheeting having a fold-line positioned midway between the two lines of apertures so that the lines of apertures are brought into registration with one another when the carrier sheet is folded along the fold-line.

3. Blister packaging as claimed in claim 2, in which the fold-line is formed by a linear weakening crease in the carrier sheet.

4. The combination claimed in claim 1, in which the carrier sheet has more than two thicknesses superimposed upon one another and each of which contains a registering line of apertures.

5. Blister packaging as claimed in any one of the proceeding claims, in which the carrier sheet comprises cardboard having a paper sheet bearing printing attached to one side.

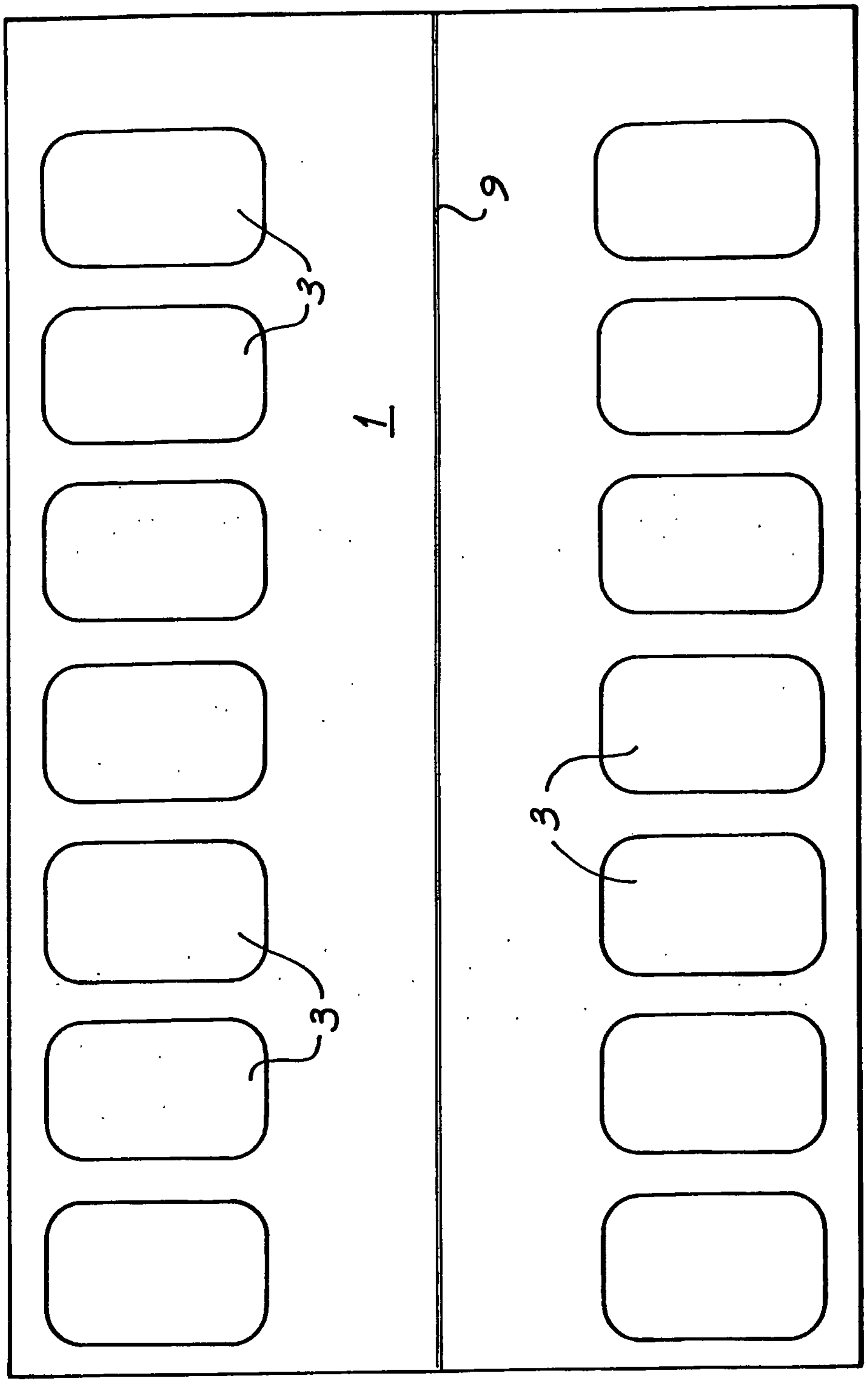


FIG. 1

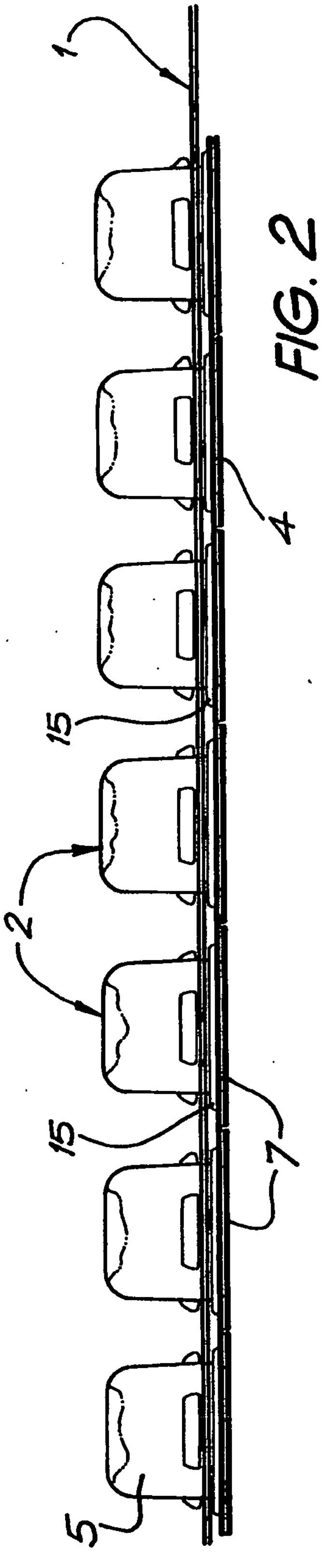


FIG. 2

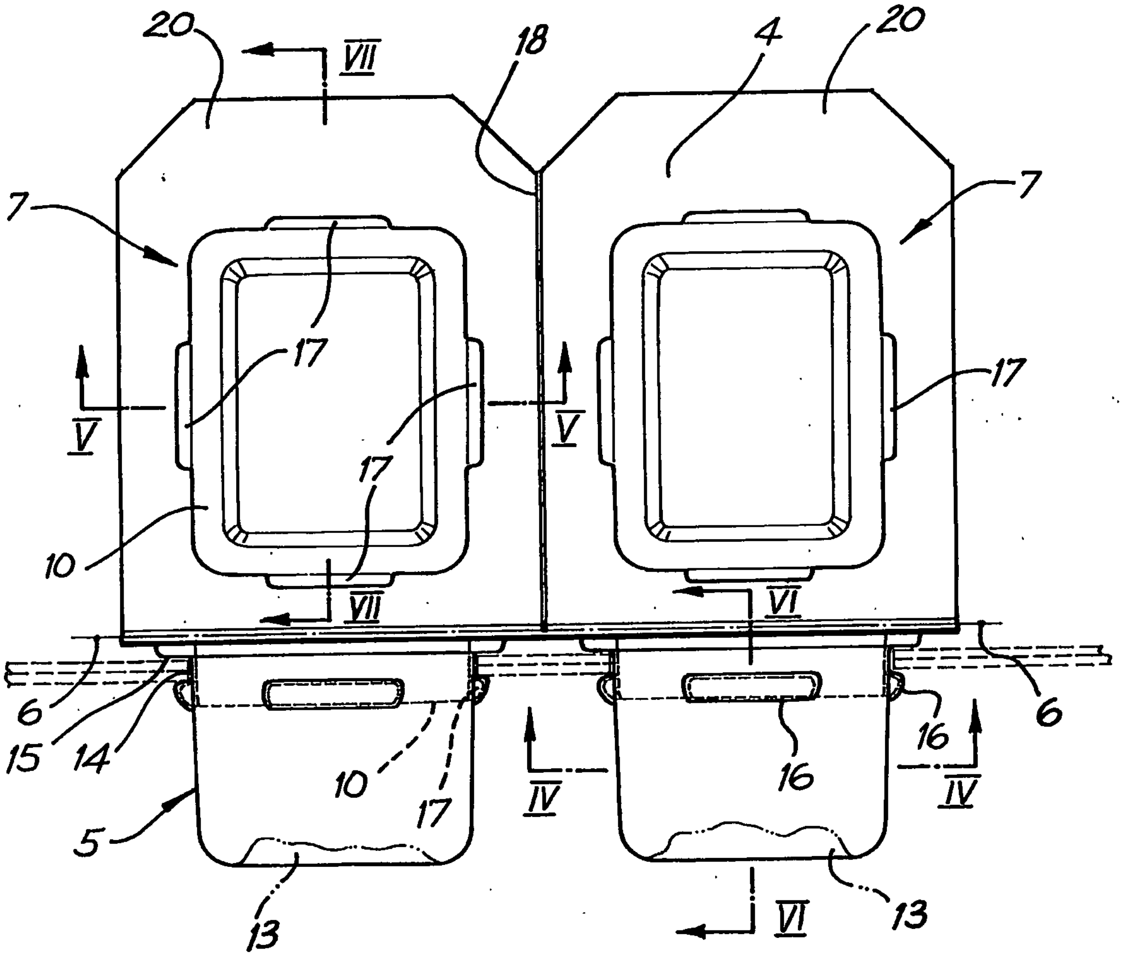

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FIG. 3

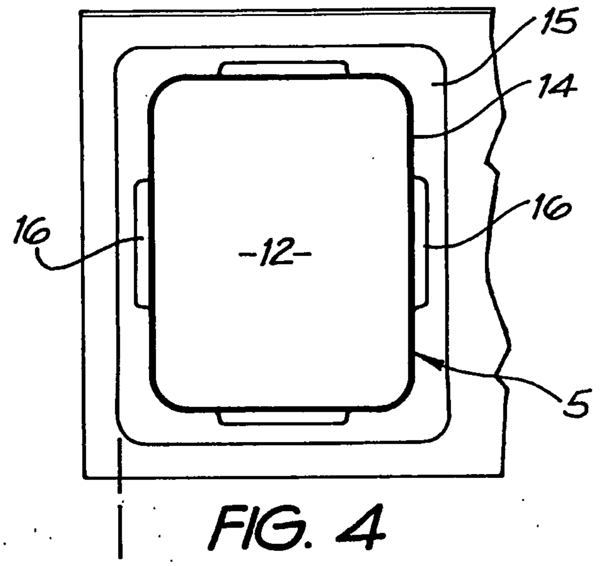

FIG. 4

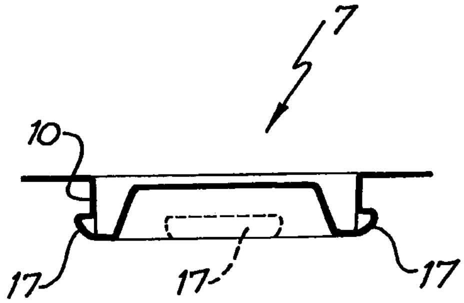

FIG. 5

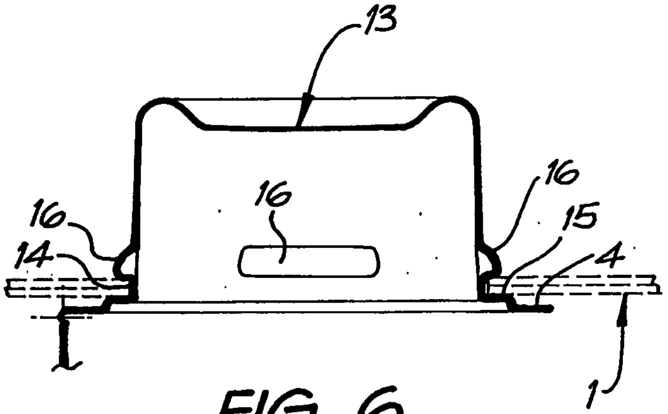

FIG. 6

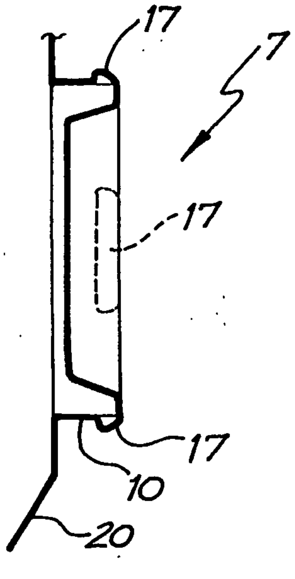

FIG. 7

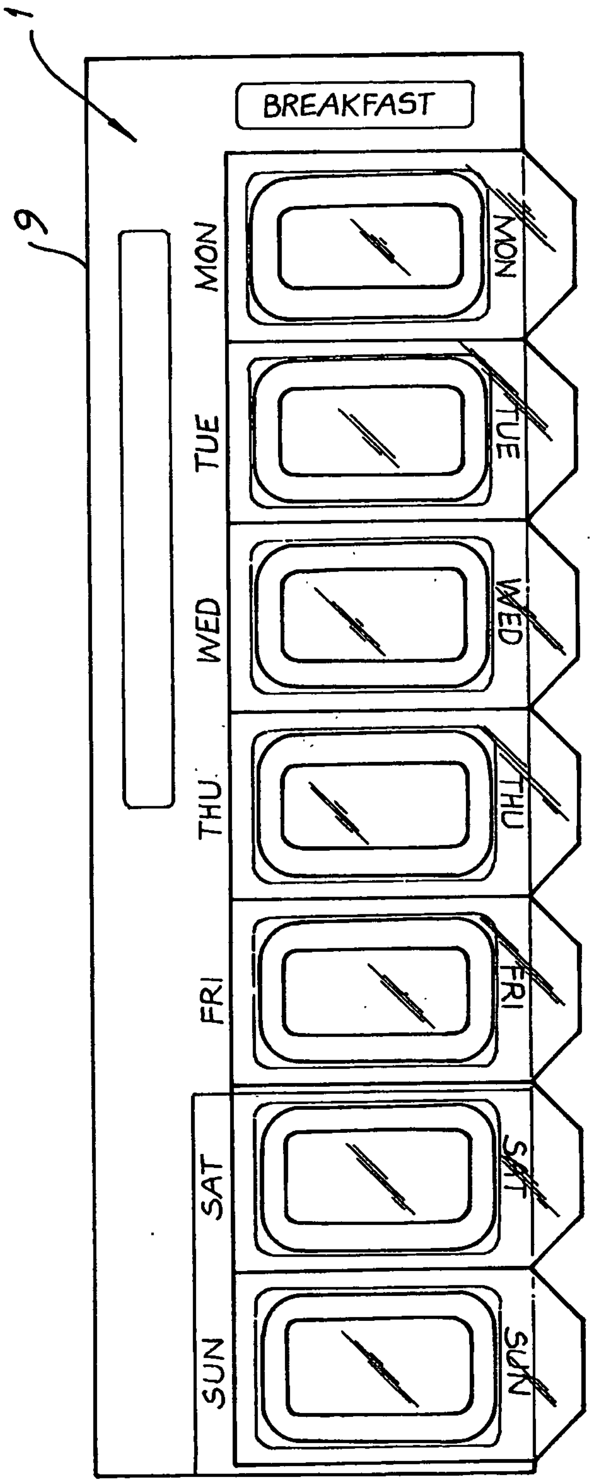
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FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.
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A.	CLASSIFICATION OF SUBJECT MATTER
Int. Cl. ^{7}:	B65D 75/36, 83/04, A61J 1/03, B65B 11/50

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DWPI IPC B65D 75/-, B65B 11/-, A61J 1/- and KEYWORDS blister, pouch, compart+, pocket, cavit+, multi+, plural+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1234780 A1 (ALCAN TECHNOLOGY & MANAGEMENT AG) 28 August 2002 Whole document	
A	DE 199 50 781 A1 (KNOLL AG) 26 April 2001 Whole document	
A	WO 2000/064779 A1 (GLAXO GROUP LIMITED) 2 November 2000 Whole document	
A	WO 1994/007761 A1 (R.P. SCHERER CORPORATION) 14 April 1994 Whole document	

☐ Further documents are listed in the continuation of Box C ☒ See patent family annex

*	Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 31 May 2004	Date of mailing of the international search report - 3 JUN 2004
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer **COLIN FITZGIBBON** Telephone No : (02) 6283 2226

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2004/000296

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
EP	1234780	AU	49217/00	CA	2373280	EP	1057744
		EP	1232959	EP	1234781	WO	2000/75039
DE	199 50 781	EP	1094430	JP	2001/188475	US	6669236
WO	2000/64779	AU	41195/00	EP	1173368		
WO	1994/07761	CA	2144538	EP	0662918	US	5358118

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX